

A Blueprint for Roadway Safety and Traffic Records

OTS Roadway Safety grants do not include highway design, maintenance or construction. Rather, it is a program intended to effect improvements in the roadway environment by enabling traffic engineers and others with traffic engineering responsibilities to identify and recommend solutions to traffic hazards attributable to the roadway and its appurtenances. Traffic controls such as signage, striping, traffic volumes, turning movement patterns and roadway geo metrics are all factors that must be considered in performing a complete traffic engineering analysis. An engineering solution represents a long-term improvement that should reduce not only the incidence of serious collisions, but also the need for close monitoring by law enforcement.

Roadway Safety projects may include any of the following agendas:

- The installation of milepost markers in rural areas
- The procurement and use of computer software to identify critical collision locations
- The purchase and installation of computer software to inventory traffic control devices
- The establishment of Traffic Control Device/stripping maintenance schedules
- The establishment of regular and systematic traffic counts

When performed in conjunction with a Traffic Records program, a Roadway Safety project may provide a grantee agency with a broad based, comprehensive Geographical Information System (GIS) or other similar automated system. The developed system must address the bulleted agendas (above) with the enhancement of graphics, data storage, and retrieval of collision and law enforcement activities.

Traffic Records - refers to the collection, storage, retrieval and manipulation of data pertaining to traffic operations. From a traffic safety perspective, collision records must be the primary data set of any traffic records system. The capture of this data will allow for the identification and definition of relevant local traffic safety issues. Additionally, traffic record systems will also develop their own unique data sets capturing data peculiar to the local program. These programs may include law enforcement traffic programs, judicial programs, traffic engineering data, emergency medical service programs, driver information files and vehicle registration programs. Therefore, it is important to consider the immediate, as well as the future, information needs of your community when designing your traffic record program.

To determine your needs, it is suggested that you review the recommended objectives and decide which objectives best suit your situation and needs. Also, it is strongly advised that you assess the types and characteristics of the data presently captured by your organization and the level of difficulty associated with the retrieval of the data. In some cases, you may find that the data is incomplete and/or difficult to retrieve and use. In short, your procedures may require redevelopment.

Purpose

This document provides grantees with information regarding options and guidelines for implementing a complete highway engineering or traffic records program. Multiple factors must be considered when developing either a roadway safety or a records program. Factors such as population, geography and staff expertise must be considered. This document recommends objectives for roadway safety and traffic records projects. Not every project must undertake every objective, however, there is general consensus amongst Traffic Engineering professionals that the recommended objectives contained herein address factors that should be considered central to a comprehensive traffic engineering and traffic record analysis.

Problem Identification

Before beginning to develop your project, the who, what, where, when and how of the problem must be clearly defined. A review and statement of the pertinent statistical data from CHP's Statewide Integrated Traffic Records System (SWITRS) and local department records should be used. SWITRS can assist in identifying the problem(s) and/or deficiency(s). The following are data categories that you may include in your problem identification:

- Number of fatal and injury collisions
- High collision locations
- Roadway mileage in county or municipality

Your problem identification should also include a review of your agency's/community's past and present efforts to address the problem. Also, if possible, compare the communities similar in population and other characteristics to your community. Calling upon the experience of other communities will help you choose the appropriate course of action and avoid the pitfalls experienced by other communities undertaking similar projects.

Statement of Problem

Present the problem so that there is a logical and certain connection of the project goals and objectives to the proposed solution. The "Statement of Problem" must answer the following questions.

- What is the traffic safety related problem or deficiency?
- How was the problem or deficiency identified?
- What factors contribute to or are affected by the identified problem?

Relevant statistical data used to identify the problem or deficiency must be provided to support the statement. Optimally, three years of data should be presented.

OTS Collision Rankings provide another resource for problem identification. OTS produces collision rankings for all counties and cities with a population greater than 25,000 for the following categories: 1) *total fatal and injury collisions*, 2) *alcohol involved collisions*, 3) *speed related collisions*, 4) *nighttime 9 p.m. - 3 a.m. collisions* 5) *hit-and-run collisions*, 6) *Had Been Drinking (HBD) Drivers <21*, 7) *HBD Drivers 21-34*, 8) *pedestrian victims*, 9) *pedestrian victims age 65 and older*, 10) *pedestrian victims <15*, 11) *bicyclist victims*, 12) *bicyclist victims <15*, 13) *DUI arrests (cities only)*.

Program Assessment

Traffic Records and traffic engineering data can be utilized by traffic engineers and traffic enforcement officers as well as other governmental agencies. Traffic enforcement personnel use the data to strategically deploy resources. Additionally, this data can also be used by traffic engineers to analyze critical traffic safety locations and recommend improvements in the operating environment that will mitigate hazards for all roadway users.

To assess your traffic records and traffic engineering programs, determine which of the modules described below are already implemented. Then determine which measures are appropriate for the execution of departmental responsibilities. Lastly, determine what system enhancements your department could utilize. Please note, a thorough assessment will also estimate resources required to prepare required reports and summaries described in the “objectives” section. It is suggested that you review the recommended objectives and decide which objectives best suit your situation and needs. Also, we recommend you assess the types and characteristics of the data presently captured by your organization and the level of difficulty associated with retrieval of the data. In some cases, you may find that the data is incomplete and or difficult to retrieve and use. In short, your procedures may require redevelopment.

Summary

Below is a list of objectives which identify a comprehensive roadway safety and/or traffic records program and recommend specific measurable performance criteria. At a minimum, the objectives should be considered for inclusion in proposals for project funding submitted to the Office of Traffic Safety. Note: since traffic-engineering projects provide the basis for long-term solutions to identified hazardous conditions, near-term results may not render significant statistical improvement within the term of the grant project. However, when a project seeks to address a critical collision location and immediate results are anticipated, the forecasted reduction should be included.

Comments on how this BLUEPRINT may be improved are welcomed and appreciated. OTS will continue to update and improve the BLUEPRINT to reflect the best practices and information for achieving successful Roadway Safety and Traffic Records Programs. Please contact an OTS Regional Coordinator with questions or comments.

Performance Measures

Goals

1. The goal of a roadway safety project is to identify, develop and support programs that will enhance the systems and the staff expertise to enable agencies to improve the efficiency and accuracy of its identification, analysis and subsequent mitigation of critical collision locations.
2. The goal of a traffic record project is to ensure that all grantee agencies charged with the responsibility of traffic safety have timely access to current and complete traffic related data. Further, the data captured should identify and isolate critical traffic safety issues.

Objectives

Public Information and Education

1. To issue a press release announcing the kick-off of the project by _____, 200_. The press release will be forwarded to OTS Public Information Officer at pio@ots.ca.gov and the OTS Regional Coordinator for approval prior to the release. Printed newspaper copies of the press release will be faxed or e-mailed to OTS.
2. To use the following standard language in all press and media materials:
“Funding for this program was provided by a grant from the California Office of Traffic Safety.”
3. To e-mail to the OTS Public Information Officer at pio@ots.ca.gov and OTS Regional Coordinator at least one month in advance, a short description of any new traffic safety event or program.
4. To submit print clip articles ***by 9 a.m.*** to the OTS Public Information Officer by e-mail at pio@ots.ca.gov and OTS Regional Coordinator, or via fax at (916) 262-2960. Include publication name and date the article was published on all clips.
5. To e-mail all press releases or media advisories, alerts, and material to the OTS Public Information Officer at pio@ots.ca.gov and OTS Regional Coordinator for approval prior to their release.
6. To conduct a press conference or media event by insert date to kick-off or publicize the grant. OTS will be notified at least two week in advance of the grant kick-off event.

7. To use the Business, Transportation and Housing Agency, California Energy, and Office of Traffic Safety logos in all press and media materials when feasible and practical.
8. To identify _____ (number) critical intersections and _____ (number) critical street segments where collisions exceed established definitions of a high collision location by _____ (date).

Note: Various formulae exist in traffic engineering manuals for defining a critical collision location. Once criteria for a critical location have been established, you must then determine the extent to which you maintain or have readily available the data needed to compute the formula.

Geographic Information Systems (GIS) or Other Automated Collision Analysis System

9. To reduce the time that it takes to identify high collision locations, produce special and statistical analyses, and collision research by _____% from the 200_ base year of _____ (hours) and _____ (minutes) to _____ (hours) and _____ (minutes) by _____ (date). The corresponding salary savings are to be tracked and reported.
10. To expedite the time between an incident and its date of entry into the system by _____% from the 200_ base year average of _____ hours and _____ minutes to _____ hours and _____ minutes by (date). The corresponding salary savings will be tracked and reported.
11. To provide the ability to generate daily, weekly, monthly or annual activity reports by _____ (date). Reports must be customizable and contain data relevant to traffic enforcement and/or traffic engineering activities.
12. To develop a street centerline map of _____ (number) miles of streets including the geographical coordinates of each identifiable node and the ability to provide data to ArcInfo or some similar automated mapping application by _____ (date).
13. To provide a comprehensive electronic traffic records network including hardware, software and network cabling or other linking media for the police department and the department of public works.
14. To implement a software application to provided the means of producing a current report identifying the number and severity of collisions occurring at the _____ (number) critical locations by _____ (date).
15. To implement software with the ability to correlate collisions with components such as roadway design, signal timing, visibility, traffic volumes and other relevant factors not within the control of the drivers by _____ (date).

16. To establish regular meetings between the police department and the department of public works to share the collected traffic related data.
17. To enable the secure and confidential exchange of data between agencies by _____ (date).
18. To ensure that the network system includes a relational database management system (RDMS) for storing and processing data for the following:
 - Collisions-Files containing all fields included in the current collision report (CHP form 555) Arrests and Citations-Files containing records of all traffic law violations for which citations were issued or violators were arrested. The data in these files should included case dispositions and BAC levels when appropriate.
 - Roadway Location File - Using a Geographical Information System, a computer based application that references relevant geographic reference points such as latitude and longitude or points on a grid. The developed system must also provide for data output in the form of drawing or plotting software such as Autocad.
 - Highway Inventories-File which typically include a Traffic Control Device Inventory (signs, signals, pavement markings), and an inventory of roads, including pavement type, alignment, curvature, capacity and structure with specific location identifiers.
 - Operational Characteristics - A computer application providing the ability to track average daily traffic volumes, peak hour volumes, turning movements, speed limits and actual speeds. It may include descriptors of adjacent land use and environmental conditions affecting traffic.
19. To identify _____ (number) of high collision locations to be improved, scheduled for improvement or recommended for improvement by _____ (date).
20. To increase the number of collision locations analyzed by _____ (percent) from the calendar base year total _____ (number) to _____ by _____ (date).
21. To provide a software application with the means of producing current reports ranking collision locations by number and primary collision factor (PCF) by _____ (date).
22. To train _____ (number) of staff members in the usage and maintenance of the finalized version of the system software by _____ (date).

For GIS Systems proposed for use in enforcement agencies, the following objectives must be included:

23. To establish a Geographical Information System (GIS) by _____, 200_, to track collision data, collision locations, and traffic citations.
24. To begin inputting all traffic citation information into the GIS database within ____ days of the citation issuance date by _____, 200_.
25. To begin tracking license plate numbers with the GIS database to help identify suspects in criminal and/or traffic related incidents by _____, 200_ and to inform OTS of any significant resulting arrests.
26. To automate the DUI reporting process by _____, 200_.

For GIS Systems proposed for use in agencies that have either statewide or countywide projects, these objectives may be helpful.

27. To create a database of information as to the geographical location of activities throughout the state or county that is compatible with GIS statewide software for graphically outputting a graphic of either California or the county within California.
28. To output the graphic of either California or the county that shows the location of activities.

GIS provides statewide and county agencies with capability to output a graphic image of the state of California or county graphic showing pinpointing of events in general or by specific dates or spans of time. On that graphic of California or county may be pin points that will have lines leading out into the margins beyond the borders of the state or county graphic. At the ends of the call out lines can be text describing a specific event that occurred at that geographical coordinate in California or the county. This GIS technology allows California agencies to illustrate graphically its geographical densities of events and activities based on geography. An agency may color the call outs differently for differentiating activities, or jurisdictions.



Traffic Control Device Inventory

29. To identify, assess and inventory all traffic control devices for _____ (number) miles of streets or highways by _____ (date).
30. To assess the condition of existing traffic signs and striping and develop a schedule of maintenance and repair by _____ (date).
31. To implement a computerized traffic control device inventory (TCDI) module in the engineering application that will allow for storage and retrieval of relevant traffic control device information to track, inventory and scheduling maintenance and replacement logs by _____ (date).
32. To implement a computerized traffic control device inventory (TCDI) module in the engineering application that will allow for storage and retrieval of relevant traffic control device information by _____ (date).
33. To complete a citywide TCDI that will include the location, type, installation date and condition of all signs, pavement markings and striping. Also the TCDI should identify deficient and those that fail to conform to MUTCD or CALTRANS standards by _____ (date).
34. To establish the methods and procedures by which the citizens may report observed deficiencies i.e., misaligned storm grates, missing or damages signs, malfunctioning traffic signals or any other roadway conditions that may contribute to traffic collisions or traffic congestion by _____, 200__.

Note: In some cases, agencies may wish to engage in a project to automate existing manual sign inventory systems or to upgrade obsolete automated systems or to combine a variety of systems into a Geographical Information System (GIS). In these cases, some or all of the following objectives may apply.

A project that includes a traffic control device inventory must also include a system for the regular review, inspection and repair of those devices.

35. To perform traffic counts at _____ (number) locations at least once each year and to maintain traffic volume data in a traffic volume database by _____ (date).
36. To implement a traffic count database system that will permit identification of traffic volumes on _____ (number) miles of streets and turning movement patterns at _____ (number) major intersections by _____ (date).

Note: A project that includes traffic counts may also include the purchase and use of traffic counters. An additional project objective would therefore be simply to provide _____ (number) traffic counters. Any count project must include a program for the regular and systematic use of the counters.

37. To develop and distribute "Suggested Route to School" maps to the residents of _____ (name) school districts involving _____ (number) schools by _____ (date).
38. To recommend new or improved bicycle facilities along _____ (number) miles of streets and roads by _____ (date).
39. To purchase and install _____ (number) mileposts and milepost markers along _____ (number) miles of rural roadway by _____ (date).

Resources

To receive NHTSA publications and other NHTSA materials please write, phone, fax, or e-mail your request to:

NHTSA
Traffic Safety Programs
Washington, DC 20590
Phone (202) 366-0910
Fax (202) 366-7149
<http://www.nhtsa.dot.gov/>

- Statewide Integrated Traffic Records System (SWITRS)

California Highway Patrol
(916) 375-2850